



Advanced Development Programs

Air Transportation System

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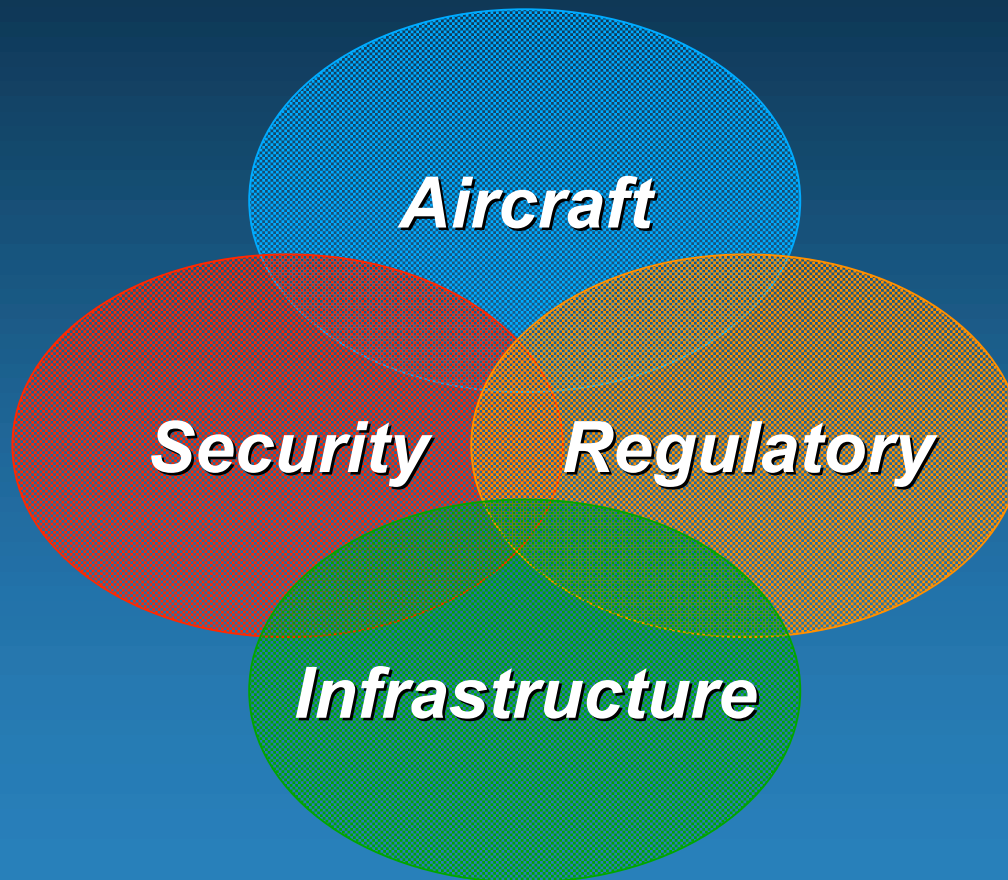
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Air Transportation System



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Simple Model



Available Solutions



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- **New aircraft enabling new operating concepts**
- **Rationalize the system for “free flight” environment**
- **Prognostic Health Management to enhance safety, reduce downtime**

Aircraft

- **Less reliance on inspections, more on tracking and “soft” technologies**
- **Container technologies advancements, “secure, smart containers”**

Security

Regulatory

- **Increasingly open skies**
- **Improvements in ATC technologies**

Infrastructure

- **Dynamic mission planning and re-planning improvements**
- **Adaptive airspace architectures for dynamic environment**
- **Improvements in terminal operations**

Have We Missed Something?



Trends In Transportation System



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- **Fastest growing air transport segment is freight**
 - *Nearly a third of U.S. air transport is expected to be cargo in 2003*
 - *Time to double: less than a decade*
- **Cargo will be clogging the nodes / hubs**
 - *Gateway congestion intensified by heightened security following 9/11/01*
- **Trend in passenger air transport away from hubs, toward point-to-point service**
 - *Driven by congestion at the hubs*

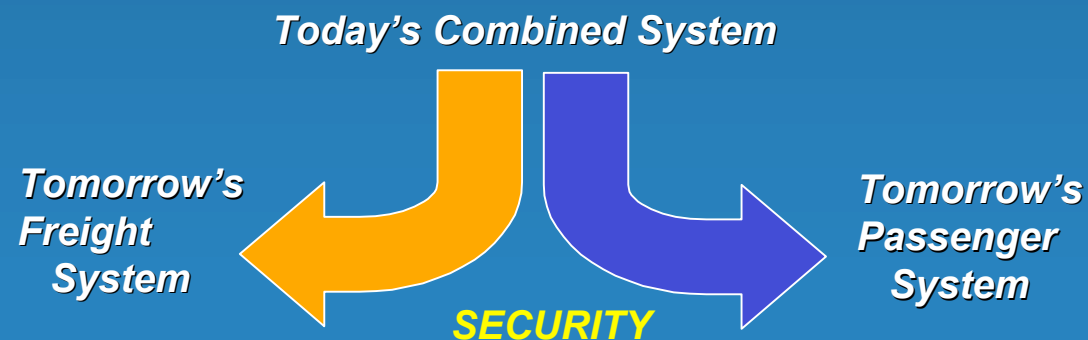


Have We Considered ...



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- Air cargo will double again by 2013 but passenger travel will not double till 2020 or beyond
 - *New kinds of transports are needed*
 - *New vehicles are decades in development*
- Decoupling passenger from freight transportation?
 - *Relieving congestion at the nodes, on ground and in air, will require new facilities and*
 - *Separating facilities, as occurred years ago with rail, road, and ocean*

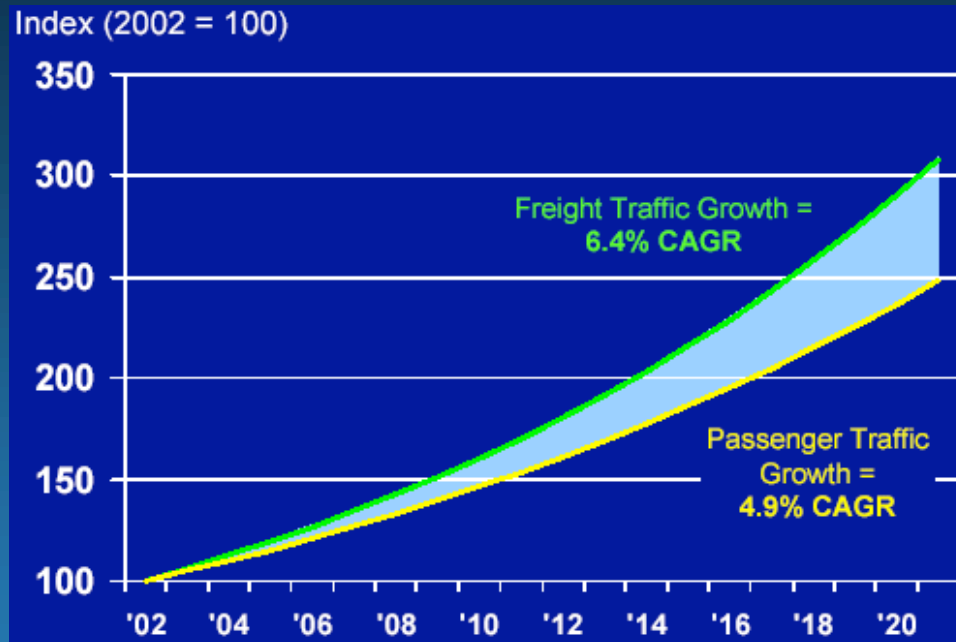




Implications



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- For passengers: faster, smaller aircraft, networks with hub-free routes
- For cargo: larger aircraft flying into freight-dedicated inter-modal nodes

Source: MergeGlobal, Inc. from Boeing Current Market Outlook – 2002 and World Air Cargo Forecast – 2002

BUT ... once in the air, one shared airspace system



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- **We have a decade, two at the most, until economic growth worldwide is strangled by zero-growth in air transport capacity**
- **New solutions must set roots today**